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EFFECTS OF STATINS IN DIABETIC AND NON-DIABETIC PATIENTS

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Statins act as a cornerstone for preventing cardiovascular diseases. In the core, these are medications that are used to lower Cholesterol, mainly LDL and to stabilize plaques in arteries. Statins work by blocking an enzyme in the liver called HMG-CoA reductase which is responsible for producing Cholesterols. That is its usual impact, but their effects differ significantly between patients with and without diabetes. Individuals with diabetes already face 2% higher risk of CVD and dyslipidemia.

The study of the effects of statins in diabetic and non-diabetic patients is based on the following main criteria: Cardiovascular benefits, Glycemic effects, Efficacy of lipid lowering and Adverse effects. Despite their cardiovascular benefits, statins have been associated with adverse effects on Glucose metabolism. Evidence from a large-scale randomized controlled trials and meta-analysis indicates a small but statistically significant increase in blood glucose levels and Glycated Hemoglobin (HbA1c).

The JUPITER trail, which evaluated Rosuvastatin in individuals without diabetes at baseline, reported a 26% increase in the incidence of new-onset diabetes. Plus, meta-analyses involving 90,000 participants. It suggests that statin therapy relates to approximately a 9% relative increase in diabetes risk. Statins accelerated the diagnosis of diabetes by a small margin.

The risk of statins causing diabetes varies by type and dose. Lipophilic statins like Atorvastatin are more likely to affect glucose due to better tissue penetration, while hydrophilic ones like Pravastatin have less impact, as shown in the WOSCOPS trial. Additionally, high-dose statins carry a higher diabetes risk than moderate or low doses, indicating a dose-dependent effect on blood sugar. In diabetes patients, the cardiovascular benefits of statins are greater than the risks associated with increased glucose levels. Given in their increased baseline risk, even a slight decrease in LDL cholesterol converts into clinical benefits.

In non-diabetic individuals, they are at low cardiovascular risk, the balance between benefit and risk requires attention. Although there is a relative rise in the risk of developing diabetes, the actual or absolute risk stays low. Overall, the advantages of using statins tend to outweigh the risks for people with moderate to high risk of heart disease. Several mechanisms have been proposed to explain the effects of statins. These may impair insulin secretion by affecting pancreatic β -cell function and reduce peripheral insulin sensitivity, particularly at higher doses or in individuals with prediabetes or metabolic syndrome.

Statins may also disrupt the expression of glucose transporters and interfere with intracellular signaling pathways that regulate glucose metabolism. These impacts are more significant in people with existing risk factors like obesity, metabolic syndrome, or prediabetes, making them more vulnerable to developing diabetes caused by statin use. Clinical decision-making should involve in an individualized assessment of both cardiovascular risk and potential for adverse metabolic effects. Regular monitoring of blood glucose and HbA1c levels is recommended, particularly in patients with risk factors for diabetes. In conclusion, Statins remain highly effective in reducing cardiovascular risk in both Diabetic and Non-diabetic patients. Although they slightly increase the risk of diabetes, their overall benefits generally outweigh these risks, particularly in high-risk populations.